REMARKS

Claims 1-9 are pending in the application. With entry of the amendment, claims 1-3, 5-7 and 9 are amended and claims 10-17 are new.

Claim Amendments

Claims 1-3, 5-7 and 9 have been amended to address the clarity objections at paragraphs 4 to 8 of the Office Action.

New claims 10 – 17 have been added. New independent method claim 11 is based upon original claims 7, 8 and 9, as well as on the description at page 5 of the published PCT specification. New independent apparatus claim 15 broadly corresponds to claim 11; claim 16 corresponds to claim 13. New dependent claims 10, 14 and 17 are being added directed to the OSPR (One Step Phase Retrieval)-type procedure described at the bottom of page 5 of the PCT specification.

Claim Rejections

The Examiner rejects claim 7 under 35 USC 102(b) as being anticipated by Kasazumi, et al. (EPO 450644) and claims 1-6 and 8-9 under 35 USC 103(a) as being unpatentable over a combination of Kasazumi, et al. and Hesserlink, et al. (US 5,995,251). These rejections are respectfully traversed.

In brief, there is a fundamental difference between the claimed subject matter and that of both Kasazumi and Hesserlink, which is that both these references display an image on the SLM whereas Applicants display a hologram on the SLM. This has a fundamental effect on the operation of the respective systems, in particular because the hologram diffracts light and interference of the diffracted light creates the replayed image. The claimed pixellated phase mask modifies this diffraction process in a manner which is different to the effect that a phase mask has on an image displayed on an SLM in a conventional manner. Both Kasazumi and Hesserlink relate to display of a conventional, non-holographic image on an SLM.

Kasazumi, et al.

In more detail, referring first to Kasazumi, this describes apparatus for recording a hologram, but the image displayed on the liquid crystal device is, nonetheless, a conventional image, not a hologram. This can perhaps be most easily appreciated from Figure 5, which shows the holographic image recording optical system in which the object beam enters a liquid crystal device 1 through a diffuser 80 and in which a reference beam is used to form an interference pattern on photographic plate 60 (see the description of example 5 at page 6, in particular page 6, line 54 to page 7, line 2). It will, therefore, be appreciated that the hologram is formed in photographic plate 60 by interference of an object and a reference beam (a conventional technique for fabricating a hologram) and that, therefore, the image on the liquid crystal device 1 is a conventional image and not a hologram. The reason that Example 2 describes the use of a diffuser 200 is to suppress the speckle noise which would otherwise be generated by illuminating the SLM with a coherent light source (page 5, line 4; the Examiner will appreciate that a coherent light source is necessary to record an interference pattern on photographic plate 60). It is respectfully submitted that nowhere does Kasazumi, et al. say that a hologram is displayed on the SLM – which is as expected because, it is respectfully submitted, it is clear to one skilled in the art that the arrangement of Kasazumi et al. does not work in that way.

Hesserlink, et al.

Referring next to Hesserlink, et al., it is again respectfully submitted that this does not teach or suggest that the spatial light modulator used in the described apparatus displays a hologram – indeed the description makes it clear that were the SLM 20 to display a hologram the described holographic data storage apparatus would not work. In more detail, referring to the Figure accompanying the abstract, light from the SLM 20 is focused by lens 24 onto the CCD 32 and a hologram is recorded in storage material 26 by reference beam 38. The spatial light modulator is located at an object plane 21 of lens 24 and the CCD 32 is located at a corresponding image plane 41 (column 2, lines 20-22; column 3, lines 48-50). During the readout process (Figure 3; column 4, lines 38-60; column 2, lines 41-47) reference beam 38 reproduces the converging part of the beam 39 to illuminate CCD 32. It is, therefore, respectfully submitted that it is clear that the image on SLM 20 is not a hologram but a

conventional image, which is focused onto CCD 32 during recording, the latter portion of this beam being reproduced during data readout. The purpose of the phase mask is illustrated in Figures 4a and 4b and described in the paragraph spanning columns 4 and 5 – it is to reduce the intensity of light at zero spatial frequency to make it easier to record high quality holograms in the storage material 26 (column 5, lines 19-21). This makes it clear that it is material 26 which stores a hologram; a hologram is not displayed on SLM 20. Again, as expected, there is no statement or implication anywhere in Hesserlink, et al. that a hologram might be displayed on SLM 20 – which is as expected because the apparatus of Hesserlink, et al. does not (and could not) operate in that way.

It is, therefore, respectfully submitted that neither Kasazumi, et al. nor Hesserlink, et al. are devices in which a hologram is displayed on an SLM (or other similar pixellated hologram display device), and that, therefore, neither are relevant to the claimed subject matter. For completeness, it is noted that neither Kasazumi nor Hesserlink make any reference to increasing the viewing angle or resolution of an image replayed by a pixellated hologram display device (SLM), as recited in the claims.

The dependent claims are patentable by virtue of their dependence on patentable independent claims and, moreover, recite additional novel and inventive subject matter.

Reconsideration of the rejections under 35 USC 102(b) and 35 USC 103(a) is respectfully requested.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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